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Solid Waste and Emergency Response (5306W)

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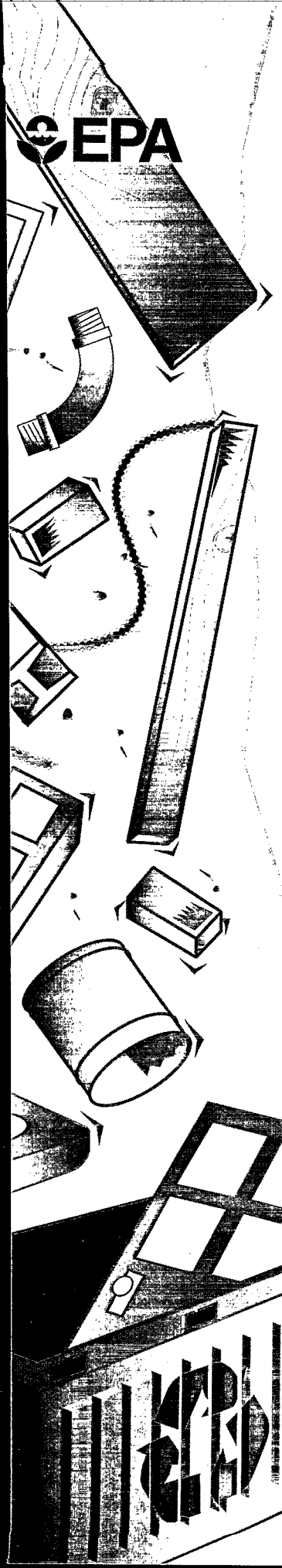


Marion County Senator Block

Salem, Oregon

82% Reduction of Demolition Materials

Marion County and Salem Area Transit saved almost $160,000 when their contractor demolished all the buildings on the city's Senator Block to make space for Salem's new courthouse square. The contractor exceeded the county's landfill diversion goal of 90% by diverting 92% of demolition materials: 13,700 tons (82%) through recycling and reuse, and 1,600 tons (10%) through the generation of wood chips for use as fuel in industrial boilers. Recycling and reuse saved Marion County and Salem Area Transit over $165,000. An additional $58,000 in equipment and labor costs for materials recovery were offset by $188,000 savings in hauling and disposal tip fees and $36,000 in revenue from materials sales.

Project Description

In 1997, Marion County set an example for other demolition projects in the area when it required its demolition contractor, Staton Companies, to divert waste from area landfills while clearing the site for Marion County's new courthouse square and transit station. The county set a goal of 90% landfill diversion based upon its research of other recovery efforts.[1]

The Marion County Senator block consisted of seven buildings, including a parking garage, retail stores, and an apartment building. Prior to demolition, Marion County's Facility Management Department salvaged more than 20 types of items for future reuse, such as light fixtures, air conditioners, and fire prevention equipment. The contractor's crews then removed metal pipes and HVAC ducts from each room using a small loader. The crews also removed asphalt roofing, concrete, and wood, such as large, old growth timbers, small timbers, and doors.

After salvage operations were completed, the contractor's crew demolished the buildings using a large track excavator and a crane with a wrecking ball. The crew then sorted the remaining wreckage, both mechanically and by hand and delivered metal (590 tons), asphalt and asphalt roofing (845 tons), and concrete (11,571 tons) to local recycling companies. These companies recycled these materials into new metal, roadbed mix, and slope stabilization materials. In response to calls from local residents requesting bricks, the contractor had crew members sort 661 tons of bricks into a pile and surrounded the pile with a safety fence. The county then sponsored the "Great Brick

Materials Collected

Recycled

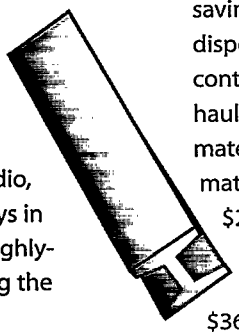
- scrap metal (including HVAC ductwork, framing, pipes, conduit, lighting fixtures, structural steel, doors and window frames), structural lumber and trees and stumps, asphalt and asphalt roofing, and concrete

Salvaged for Reuse

- bricks, wood (including old growth and small timbers), engraved cinder blocks, marble fireplace, windows, safety equipment (including emergency lights, fire alarm pulls and bells, fire extinguishers , and sprinkler heads), electrical breakers, light fixtures, lighting controls and sensors, time clocks, electrical outlets, water heaters, heat exchangers, circulating pumps, water meters, air conditioners, heaters, thermostats, humidifiers, handicapped accessibility fixtures,toilets and urinals, and doors

Giveaway," a program inviting citizens to take the bricks for reuse. The contractor delivered 1,578 tons of wood to a processor for chipping and use as industrial boiler fuel and the remaining 1,345 tons of mixed demolition materials to various local landfills.

The Marion County Solid Waste Management Department used the demolition as a tool to educate the public about recycling. The County placed advertisements on TV and radio, publicized materials giveaways in the newspaper, and placed highly-visible site banners illustrating the recycling rate of the project.



Project Summary

Date Started	May 1997
Date Completed	August 1997
Project Square Footage	178,780
Total Waste Generated (Tons)	**16,649**
Disposed (Tons)	**2,923**
Landfilled	1,345
Wood Chips for Fuel	1,578
Total Materials Diverted	**82%**
Total Materials Diverted (Tons)	**13,726**
Recycled	13,006
Salvaged for Reuse	720
Total Demolition Cost	**NA**
Hauling and Disposal Costs ($/Ton)	
Landfilled	varied
Incinerated for Energy Recovery	$28
Materials Diversion Costs	
Planning and Development	$0
Labor	$22,500
Equipment	$35,900
Hauling and Tip Fees	$94,500
Revenue/Savings from Materials Diversion	
Revenue from Materials Sales	$36,000
Savings from Avoided Hauling and Tip Fees	$283,000
Cost/(Savings) from Diversion	**($165,700)**
Cost/(Savings) per Square Foot	**($1)**

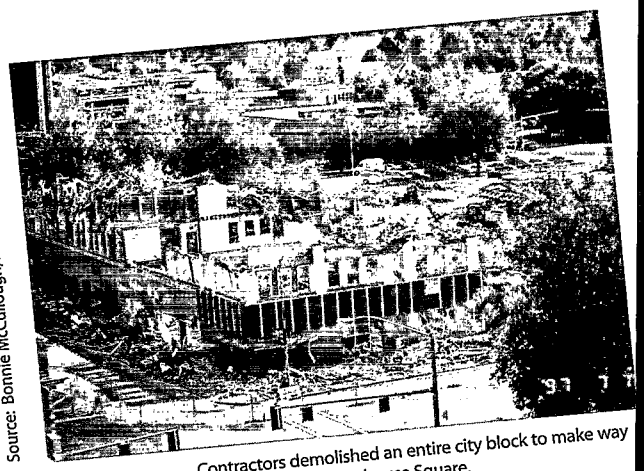
Key: NA = not available

Notes: Figures may not add to total due to rounding. Disposal tip fees varied by type of materials disposed. Savings from avoided disposal resulted from avoiding costs of hauling and disposing of metals, timbers, bricks, asphalt roofing, concrete, and asphalt. Tonnage diverted does not include materials salvaged by the county because the county did not track these materials tonnages. Materials diverted through salvage by the contractor includes 661 tons of bricks, 56 tons of old growth timbers, and 279 doors (approximately 3 tons).

Source: Institute for Local Self-Reliance, Marion County, Staton Companies, and Harding Lawson Associates; 1999

Costs/Benefits

The County and Salem Area Transit saved over $160,000 ($1 per square foot) by diverting demolition waste. The project was cost-effective because of a savings in hauling and disposal fees for waste. The contractor paid $94,500 to haul and tip recyclable materials. Disposal of these materials would have cost $283,000.



Source: Bonnie McCullough, Marion County

Contractors demolished an entire city block to make way for Salem's new Courthouse Square.

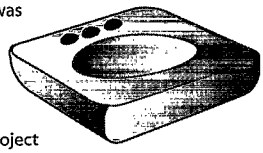
The savings from avoided disposal combined with $36,000 in revenue from materials sales offset the cost of 577 additional labor hours ($22,500) and $35,900 in heavy equipment that were required to sort materials. Revenue from the sale of metal and timbers were $25,000 and $11,000, respectively. The contractor paid to tip all other recyclables.

The contractor did not recover materials, with the exception of asphalt roofing, if the cost was more to recycle it than to dispose of it. According to the contractor, window glass, ceiling tile, and gypsum wallboard could have been recycled, but the hauling and removal costs would have been more than the materials revenue and disposal savings. The contractor also chose to dispose of most of the mixed demolition materials from the largest building because sorting concrete and steel from gypsum board and insulation was too costly.

Overall, the County and Salem Area Transit reduced their demolition costs by 5% and stockpiled tons of reusable building components while diverting 82% of demolition materials from disposal.

Tips for Replication

- Be careful not to contaminate the recovered materials, so that the materials can be delivered to the processor in a usable form.
- Include reuse, recycling, and waste prevention strategies early in the process.
- Set a goal and require the contractor to recycle.
- Involve and educate the public.



[1]Marion County's goal was based on avoiding landfill disposal. According to its definition, the County surpassed its goal; diverting 82% of the project demolition materials through recycling and reuse and 10% through burning of wood chips as industrial boiler fuel. EPA considers incineration to be disposal; therefore, by EPA's definition, Marion County's diversion rate for the project is 82%.

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